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EXAMINER
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ANGEBRANNDT, MARTIN J

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/002,949  
Filing Date: November 15, 2001  
Appellant(s): TAKAMORI ET AL.

**MAILED  
SEP 07 2007  
GROUP 1700**

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Mark D. Russett  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed May 09/2007 appealing from the Office action mailed February 2/2006.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

The examiner notes the appeal filed in application 10/002952 (Appeal Number 2007-3146).

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

No amendment after final has been filed.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

Art Unit: 1756

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

5,714,222	Yokoyama	02/1998
5,674,649	Yoshioka et al.	10/1997
5,102,709	Tachibana et al.	04/1992
EP 1,031,972	Tajima et al.	08/2000

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

In the Appeal Brief of 5/09/2007, Sections A-E correspond to the grounds of rejection, Section F concerns all the rejection and discusses secondary considerations and section G concerns all the grounds of rejection, discussing the dependent claims specifically. The examiner adopts these designations to aid the Board in matching up the examiners and the appellant's positions.

A Claims 10-16 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Yokoyama '222.

An optical recording medium with a resin substrate and a magneto-optical recording film is coated with a 6 microns UV cured urethane-acrylate (MH-7210) (example 1), and 4 microns of epoxy-acrylate (EX-841) (example 2).

Urethane, epoxy, polyester and polyether acrylates are disclosed as useful and meeting the material limitation of the claims in the instant specification on page 11 at lines 1-6.

The assertions of the appellant are that the properties alleged by the examiner as inherent are not disclosed in the references applied. Among the arguments is data of undisclosed compositions and their properties. The examiner notes that none of these are disclosed compositionally and it is therefore difficult to determine any inherent properties and these are withdrawn as being merely cumulative to the rejections at hand without adding to the record. With respect to a number of the references applied in the previous office action, the examiner recognizes that it is difficult for the appellant to refute with factual evidence when the compositions used in the prior art are not disclosed and withdraws the majority of these rejections. The examiner notes that in the case of Yokoyama '222, the composition is specifically described and is a member of the class of adhesives described by the appellant as useful in section [0047] of the prepub of the instant specification. The examiner notes that data provided by the appellant relates to acrylic ester oligomer, acrylate monomer and a photoinitiator and none of these is either a polyester acrylate, epoxy acrylate or a urethane acrylate and therefore have limited impact on the rejection at hand. Further more this data fails to apply to the full scope of coverage sought, which embraces but is not limited to the UV light curing resins, let alone those disclosed in section [0047] of the prepub. The appellant is invited to submit material data sheets (MSDS or the like) or data from their own measurements for the UV

Art Unit: 1756

curing resins (MH-7210), (EX-841) and (SD-101) specifically used in the prior art, which describe the young's moduli and linear expansion coefficients for these compositions to address issue and clearly establish patentability over the references at hand. The examiner does not consider the conventional material described by the appellant to be urethane acrylates. The rejection stands.

The instant specification discloses the young's modulus and linear expansion coefficient for polycarbonate as  $2.41 \times 10^9$  Pa and  $6 \times 10^{-5}$  (1°C) in the tables.

The appellant states in the prepub of the instant specification "Examples of such a materials include an ultraviolet light curing resins mainly composed of polyester acrylate, epoxy acrylate, urethane acrylate, or polyether acrylate." [0047]. The arguments of the appellant are that the reference does not describe the properties of the resins disclosed in the references and therefore the examiner has not met the burden. The appellant has chosen to describe the claims in terms of materials properties not commonly measured, has made a very limited disclosure with respect to the materials (various acrylates [0047]) and has laboratory facilities (which the PTO does not have). In make such a choice, the appellant should bear the burden of the decisions they have made. The position of the examiner is that the resins of the prior art inherently have the recited properties and is congruent with the specification of the appellant. The examiner has correctly raised the issue of inherency in the prior art with respect to the resins disclosed in the prior art, which are members of the classes disclosed by the appellant. The appellant argues that various polycarbonates are known and that the polycarbonates used by Yokoyama '222 are necessarily similar enough to those of the instant specification to have the recited properties. The appellant has not presented evidence concerning the variation of the

Art Unit: 1756

recited properties in polycarbonates used for optical recording media substrates to support the argument of polycarbonates having properties divergent enough to invert the relationship with those of the UV curing resins. If the appellant had support from a text or a proper experimental declaration establishing UV cured polyester acrylate, epoxy acrylate, urethane acrylate, or polyether acrylates having properties bracketing as well as within the recited ranges, a reasonable level of doubt could be established. SD101 appears to be still available See Kakuta et al. '172 [0044].

**B** Claims 10-16 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Yoshioka et al. '649.

An optical recording medium with a resin substrate and a phase change optical recording film is coated with a UV cured urethane-acrylate (SD-101). (example 1) The tilt after 3 mrad.

Urethane, epoxy, polyester and polyether acrylates are disclosed as useful and meeting the material limitation of the claims in the instant specification on page 11 at lines 1-6.

The rejection stands for the reasons provided above as no further arguments were directed at this rejection beyond those addressed above, noting that the composition is disclosed.

**C** Claims 10-16 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Tachibana et al. '709.

Art Unit: 1756

An optical recording medium with a 1.2 micron polycarbonate resin substrate and a magneto-optical recording film is coated with a UV cured urethane-acrylate comprising a mixture of a urethane acrylate (ARTRESIN UN-9000) and dipentaerythritol pentacrylates. (examples 7 and 8). The warp is less than 10 microns over the diameter of the 12 cm disk (table 1(col. 13/14)) even after durability testing for 2000 hours at 80 degree C and 90% RH. The use of substrate which are 0.3-5 mm thick and made of polycarbonate or polyolefins is disclosed. (7/27-32)

Urethane, epoxy, polyester and polyether acrylates are disclosed as useful and meeting the material limitation of the claims in the instant specification on page 11 at lines 1-6.

The rejection stands for the reasons provided above as no further arguments were directed at this rejection beyond those addressed above, noting that the composition is disclosed and there is data relating to the testing of the medium and the resulting warpage. Therefore this has a result described as achieved in the optical recording media using the resinous protective layers meeting the recited limitation in the instant specification.

The appellant submitted data concerning example 3, which does not include a urethane acrylate and is not one of the examples pointed to by the examiner in the response of 01/26/2006. Even if the data were in a proper declaration to give it weight, there is no basis for why this could possibly be a better comparison than one with the cited example. The urethane acrylates in examples cited by the examiner are Allonix M-1100 and ARTRESIN UN-9000. The rejection stands.



Art Unit: 1756

**D** Claims 10-17 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tachibana et al. '709.

It would have been obvious to use other substrate thicknesses disclosed as useful in these references, such as 0.5 mm in place of those used in the examples with a reasonable expectation of achieving useful optical recording medium.

The rejection stands for the reasons provided above as no further arguments were directed at this rejection beyond those addressed above, noting that the composition is disclosed.

**E** Claims 10-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajima et al. EP 1031972.

Tajima et al. EP 1031972 teaches with respect to table 3, an optical recording media with a 0.6 mm polycarbonate substrate, an AlN dielectric layer and a 16 micron UV cured protective film having a linear expansion coefficient of  $5.68 \times 10^{-5}$  (1/C°). The optimization of linear expansion coefficient, thickness and Young's modulus to offset the stresses on either side of the dielectric layer to reduce warpage is disclosed. [0036-0044]. Due to the relatively larger thickness of the substrate, the linear expansion coefficient and/or and Young's modulus of the protective layer must be larger than those of the substrate. [0047]. The equation for optimizing the warpage angles is disclosed in section [0042]. The use of 0.5 mm substrates is disclosed. [0063].

Tajima et al. EP 1031972 discloses optimization of linear expansion coefficient, thickness and Young's modulus of the protective layer to offset the stresses on the other side of

Art Unit: 1756

the dielectric layer due to the substrate to reduce warpage of the medium, but does not use UV curing resins meeting the linear expansion coefficient requirements. It would have been obvious to one skilled in the art to modify the example by doubling the linear expansion coefficient to  $1.13 \times 10^{-4}$  ( $1/C^{\circ}$ ), which increases the term  $\alpha T$ , and decreasing the thickness nearly by half to increase the second term ( $P/btE$ ), and decrease the third term ( $t/2R$ ) and maintain the same force on the side of the medium opposite the side of the substrate. The increase in the linear expansion coefficient increases the counterforce offsetting that of the substrate generated in the protective layer as a function of temperature and decreasing the thickness of the layer decreases the rigidity of the layer and the amount of counterforce the layer can generate. Decreasing the thickness of the layer also reduces the amount of resins required, which reduces the cost. Further, it would have been obvious to one skilled in the art to use the same optimization with other disclosed substrate thicknesses, such as 0.5 mm.

With respect to the process claims, when equations such as that appearing in section [0042] are described as useful in reducing warpage, the examiner holds that the last layer to be coated/formed would be the obvious choice for optimization to reduce the possibility of warping/radial skew and that optimizing the thickness and mechanical properties of the to reduce the thickness thereby reducing the amount of resin used on each medium and the cost per unit and also reduces optical aberration due to the reduced thickness of the layer through which the light passes in the case of topside irradiation, by choosing resins compositions which have higher linear expansion coefficients.

The appellant argues that the examiner is using the appellant's specification as a roadmap and therefore relying upon improper hindsight. The examiner points out that the formula relied

Art Unit: 1756

upon by the examiner is in the prior art as is the thickness of the substrate and therefore cannot be the basis for improper hindsight. The examiner holds the position that the disclosed formula provides a basis for one of ordinary skill in the art to perform routine optimization to reduce a deleterious effect (ie tilt) in the prior art. In re Antonie, 559 F2d 618, 195 USPQ 6 (CCPA 1977) and In re Boesch, 617 F2d 272, 205 USPQ 215 (CCPA 1980) discuss optimization with direction from the prior art references. The rejection stands.

#### **(10) Response to Argument**

**A** The appellant is correct that the Yokoyama reference does not disclose the properties of the UV cured urethane-acrylate (MH-7210) or the UV cured epoxy-acrylate (EX-841) used in the examples and that the examiner holds that these properties are inherent. (brief at pages 11 and 12). The appellant argues that although the resins are among those disclosed, there is only a possibility or probability that the composition of the prior art have the recited properties (brief at page 12). The appellant argues that although the specification describes urethane, epoxy, polyester and polyether acrylates as useful in the instant specification, it does not describe all of these as meeting the claims limitation.

The position of the examiner is that at least one of the UV cured urethane-acrylate (MH-7210) or the UV cured epoxy-acrylate (EX-841) meet the claim limitations. There is reason to believe this based upon the disclosure by the appellant of these as materials meeting the claims limitations in the instant specification "Examples of such a materials include an ultraviolet light curing resins mainly composed of polyester acrylate, epoxy acrylate, urethane acrylate, or

Art Unit: 1756

polyether acrylate.” (prepub at [0047]). This is the sole disclosure of the materials in the specification and the properties of the cured resins would be dominated by the composition of the main chain (ie epoxy, polyester, polyether, or polyester), not the acrylate reactive moieties. The resins are clearly identified and manufactured in Japan and the PTO lacks any testing facilities, so the Japanese appellant is best suited to determining the properties of the compositions. The examiner has asked for data relating to these either from tests performed by the appellant or data sheets which might be available from the manufacturer, but the appellant has declined to provide such data. The appellant has asserted that not all the resins disclosure would meet the claims limitation, but has not provided any evidence to support this position. The appellant has also fails to disclose if the compositions used by the appellant are commercially available and if so what trade names they are sold under.

The appellant also states that the polycarbonate substrate of the prior art is not the same or similar enough to that used by the appellant to have the recited properties. (brief at page 12). The examiner disagrees with this position as there is no description of the composition of the polycarbonate in the instant specification, or any disclosure concerning the criticality of using a particular polycarbonate. Further, the prior art does not describe the specific polycarbonate used in the cited examples, so the appellant cannot in good faith assert that they are different.

The appellant argues that the reference does not teach the optical recording media of the claims which are shown in the specification to be resistant to deformation and warpage. (brief at page 13). The appellant’s argument neglect the scope of the showing, specifically, the use of the thin substrates (0.6 mm) and the thickness of the cured resin of the examples. The claims rejected

Art Unit: 1756

under this heading do not include those reciting the thickness of the substrate and the claims of record fail to recite a resistance to warpage.

The appellant further argues that the examiner has not provided any extrinsic evidence to support the position that the cured resins have the recited properties. (brief at page 13). The examiner has attempted to find this on the internet, but has not been able to locate it. As discussed above the resins are clearly identified and manufactured in Japan and the PTO lacks any testing facilities, so the Japanese appellant is best suited to determining the properties of the compositions or contacting the manufacturer to obtain data sheets of the like.

**B** The appellant is correct that the Yoshioka reference does not disclose the properties of the UV cured urethane-acrylate (SD 101 used in the cited example and that the examiner holds that these properties are inherent. (brief at pages 14-16). The appellant argues that although the resins are among those disclosed, materials described in general terms often have different properties. (brief at page 16). The appellant argues that although the specification describes urethane, epoxy, polyester and polyether acrylates as useful in the instant specification, it does not describe all of these as meeting the claims limitation.

The position of the examiner is that the UV cured urethane-acrylate (SD- 101) meets the claim limitations. There is reason to believe this based upon the disclosure by the appellant of these as materials meeting the claims limitations in the instant specification "Examples of such a materials include an ultraviolet light curing resins mainly composed of polyester acrylate, epoxy acrylate, urethane acrylate, or polyether acrylate." (prepub at [0047]). This is the sole disclosure of the materials in the specification and the properties of the cured resins would be dominated by

Art Unit: 1756

the composition of the main chain (ie epoxy, polyester, polyether, or polyester), not the acrylate reactive moieties. The resin is clearly identified and manufactured in Japan and the PTO lacks any testing facilities, so the Japanese appellant is best suited to determining the properties of the compositions. The examiner has asked for data relating to these either from tests performed by the appellant or data sheets which might be available from the manufacturer, but the appellant has declined to provide such data. The appellant has asserted that not all the resins disclosure would meet the claims limitation, but has not provided any evidence to support this position. The appellant has also fails to disclose if the compositions used by the appellant are commercially available and if so what trade names they are sold under.

Additionally, the examiner notes that the media of the prior art are described as having a tilt of less than 3 mrad, which compels one to believe that the forces from the substrate and the protective layer are balanced, irrespective of the reference describing the process. The instant specification describes a deflection of +/- 5 mrad as acceptable (prepub at [0090]) and so the prior art media exhibit the advantage ascribed to the properties of the protective and substrate materials.

C The appellant is correct that the Tachibana reference does not disclose the properties of the UV cured urethane-acrylate (ARTRESIN UN-9000) used in the cited example and that the examiner holds that these properties are inherent. (brief at pages 17-19). The appellant argues that although the specification describes urethane, epoxy, polyester and polyether acrylates as useful in the instant specification, it does not describe all of these as meeting the claims limitation. (brief at page 18).

The position of the examiner is that the UV cured urethane-acrylate (ARTRESIN UN-9000) meets the claim limitations. There is reason to believe this based upon the disclosure by the appellant of these as materials meeting the claims limitations in the instant specification "Examples of such a materials include an ultraviolet light curing resins mainly composed of polyester acrylate, epoxy acrylate, urethane acrylate, or polyether acrylate." (prepub at [0047]). This is the sole disclosure of the materials in the specification and the properties of the cured resins would be dominated by the composition of the main chain (ie epoxy, polyester, polyether, or polyester), not the acrylate reactive moieties. The resin is clearly identified and manufactured in Japan and the PTO lacks any testing facilities, so the Japanese appellant is best suited to determining the properties of the compositions. The examiner has asked for data relating to these either from tests performed by the appellant is data sheets which might be available from the manufacturer, but the appellant has declined to provide such data. The appellant has asserted that not all the resins disclosure would meet the claims limitation, but has not provided any evidence to support this position. The appellant has also fails to disclose if the compositions used by the appellant are commercially available and if so what trade names they are sold under.

Additionally, the examiner notes that the media of the prior art are described as having a warpage of less than 10 microns over the diameter (and the radius) which translates to 0.16 mrad, when exposed to 80 degrees C and 90% RH for 2000 hours which compels one to believe that the forces from the substrate and the protective layer are balanced for both thermal and humidity effects irrespective of the reference describing the process. The instant specification describes a deflection of +/- 5 mrad as acceptable (prepub at [0090]) and so the prior art media exhibit the advantage ascribed to the properties of the protective and substrate materials.

**D** The appellant relied upon the arguments of section C and the appellant argues as if claim 22 required the process of claims 18-21 to be shown. When the materials used inherently meets the limitation and have been selected, the determining process recited in the claims would have no effect and so that step need not be shown to meet the article claims.

**E** The appellant argues that as materials specifically meeting the recited limitations are not disclosed, Tajima et al. cannot anticipate or render the invention obvious (brief at pages 21-22) and further as these materials are not disclosed, they cannot be selected as required in claim 18. The appellant argues that the examiner is using impermissible hindsight to reconstruct the invention of the appellant. (brief at page 23)

The appellant's arguments fail to account for the fact that the appellants formula describing the calculation of warpage angle (prepub at [0062-0076]) is exactly the same as the formula found in sections [0042-0044] of Tajima et al. and this as a basis for optimization by one of ordinary skill in the art and the use of a thin protective layer having a thickness of less than 20 microns can be offset by the making at least one of the linear expansion coefficient ( $\alpha$ ) and the Young's modulus (E) large [0045]. In table 3, the Young's modulus is greater than that of the substrate ( $2.41 \times 10^9$  (substrate) vs  $3.60 \times 10^9$  (UV cured layer)) and meet the limitations set forth in the claims. The linear expansion coefficient of the UV cured layer ( $5.68 \times 10^{-5}$ ) is less than that of the substrate and just outside the range set forth in the claims, but clearly there is sufficient information in the formula in sections [0042-0044] to allow one of ordinary skill in the



Art Unit: 1756

art to choose cured UV resins which are within the range recited ( $9.5 \times 10^{-5}$  to  $5.0 \times 10^{-4}$ ) while maintaining a balance of the forces which results in minimal warp angles.

**F** The appellant argues the comparative data submitted as part of the attorney arguments on page 11 of the response of 3/22/05 (reproduced as appendix TAB E). Beyond the fact that it is not in proper declaration form, the data in the table does not describe the compositions beyond acrylate oligomer (acrylic ester), acrylate monomer and photopolymerization initiator” and so is of limited probative value. It could be that the urethane acrylates, epoxy acrylate, polyester acrylates or polyether acrylates group have similar properties, but is not shown in the data due to the lack of any significant information concerning chemical composition. The examiner has not set the bar unreasonably high for the appellant as the references applied in the anticipation rejections each describe a specific resin for a total of five resins which the appellant might test or obtain product information for. The appellant refers to the composition of example 3 of Tachibana et al., but the rejection is based upon examples 7 and 8, not example 3 which is not a not described as an epoxy, urethane, polyether or polyester acrylate. The position of the examiner is not any acrylate resin meets the claims, but that epoxy, urethane, polyether or polyester acrylates do. The “showing” by the appellant is flawed due to the paucity of the information contained therein and the improper form (ie not part of a declaration) and so cannot serve to obviate the rejections.

Art Unit: 1756

**G** The appellant argues that the references applied do not teach the recited limitations in section a-d [sic c, second occurrence]. The position of the examiner is that these are inherent to the compositions used.

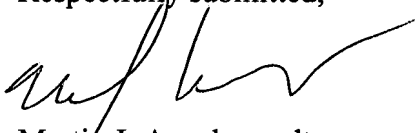
Further with respect to claim 12,13 and 19 reciting Young's modulus limitations, the examiner notes that Tajima et al. teaches  $3.60 \times 10^9$  for the protective layer and  $2.41 \times 10^9$  for the substrate, which are within the claim limitations.

**(11) Related Proceeding(s) Appendix**

The examiner notes the appeal filed in application 10/002952 (Appeal Number 2007-3146) and docketed on June 22, 2007. As of August 31, 2007 no decision has been issued.

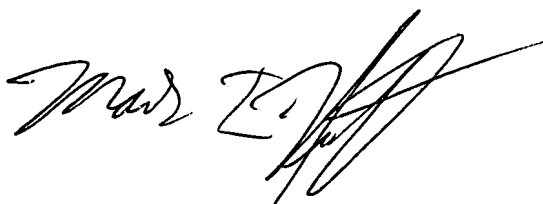
For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,



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